What is claimed is:

1. A method of isolating a high complexity nucleic acid molecule comprising:

a. hybridizing high complexity nucleic acid fragments to a functionalized nucleic acid probe having a sequence complimentary to at least a portion of a high complexity nucleic acid molecule to form hybridized nucleic acid fragments;

b. complexing the functionalized nucleic acid probe with a capture agent;

c. immobilizing the capture agent; and,

d. eluting the high complexity nucleic acid molecules from the functionalized nucleic acid probe.

2. The method of Claim 1, wherein the functionalized nucleic acid probe is a biotinylated nucleic acid probe.

3. The method of Claim 2, wherein the hybridizing step comprises incubating the high complexity nucleic acid fragments with a biotinylated nucleic acid probe at a temperature of between about 45°C and about 70°C for about 1 hour.

4. The method of Claim 1, wherein the capture agent comprises streptavidin-coated magnetic beads.

5. The method of Claim 1, wherein the streptavidin-coated magnetic beads comprise a protein-blocking material.

6. The method of Claim 1, comprising the additional step of ligating at least one DNA linker to the ends of digested high complexity nucleic acid fragments to form ligated nucleic acid fragments prior to the hybridizing step.

7. The method of Claim 6, wherein the DNA linker comprises an oligodeoxynucleotide having the sequence of SEQ ID NO:1 and an oligodeoxynucleotide having the sequence of SEQ ID NO:2 which together form the DNA linker.

8. The method of Claim 6, wherein the digested high complexity nucleic acid fragments are produced by incubating a nucleic acid with a nuclease enzyme selected from the group consisting of *Csp6*, *Xba* I, mung bean exonuclease, *Sca* I and combinations thereof.

9. The method of Claim 6, wherein the ligating step takes place in the presence of *Sca* I endonuclease.

10. The method of Claim 1, wherein the eluting step comprises:

a. washing the magnetic beads with a wash buffer at about 50°C; and,

b. incubating the magnetic beads in water at about 65°C.

11. The method of Claim 1, comprising the additional steps of:

a. amplifying the isolated high complexity nucleic acid fragment; and,

b. sequencing the amplified high complexity nucleic acid fragment.

12. The method of Claim 11, comprising the additional step of ligating at least one DNA linker to the ends of digested high complexity nucleic acid fragments to form ligated nucleic acid fragments prior to the hybridizing step, and wherein the amplification step utilizes a DNA primer having a sequence complementary to one strand of the linker.

13. The method of Claim 12, wherein the amplification step comprises the polymerase chain reaction.

14. The method of Claim12, wherein the amplification step comprises:

a. ligating the isolated high complexity nucleic acid fragment into a vector;

b. transforming the ligated vector into a microorganism;

c. amplifying the vector by maintaining the microorganism under conditions favoring growth of the microorganism; and,

d. recovering the amplified vector from the microorganism.

15. A kit for isolation of a nucleic acid fragment comprising:

a. DNA linkers comprising an oligodeoxynucleotide having the sequence of SEQ ID NO:1 and an oligodeoxynucleotide having the sequence set forth in SEQ ID NO:2 which together form the DNA linker,

b. streptavidin-coated magnetic beads, and

c. a protein blocking material.

16. The kit of Claim 15, comprising additional components selected from the group consisting of instruction manual, buffers, nucleases, wash solution concentrates, PCR primers, PCR buffers, Taq polymerase, PCR product isolation columns and combinations thereof.

17. A DNA linker comprising an oligodeoxynucleotide having the sequence of SEQ ID NO:1 and an oligodeoxynucleotide having the sequence of SEQ ID NO:2 which together form the DNA linker.

18. A DNA primer comprising the sequence of SEQ ID NO: 1.

19. A method of isolating a nucleic acid molecule comprising:

a. ligating at least one DNA linker to digested nucleic acid fragments, wherein said linker is formed by an oligodeoxynucleotide having the sequence of SEQ ID NO:1 and an oligodeoxynucleotide having the sequence of SEQ ID NO:2;

b. hybridizing the nucleic acid fragments to a biotinylated nucleic acid probe having a sequence complimentary to at least a portion of the nucleic acid molecule;

c. complexing the biotinylated nucleic acid probe with streptavidin-coated magnetic beads comprising a protein-blocking material;

d. immobilizing the streptavidin-coated magnetic beads with a magnet; and,

e. eluting the nucleic acid molecules from the biotinylated nucleic acid probe.

20. The method of Claim 19, wherein the hybridizing step comprises incubating the nucleic acid fragments with the biotinylated nucleic acid probe at a temperature of less than about 70°C for about 1 hour.

21. The method of Claim 19, wherein the digested nucleic acid fragments are produced by incubating a nucleic acid with a nuclease enzyme selected from the group consisting of *Csp6*I, *Xba* I, mung bean exonuclease, *Sca* I and combinations thereof.

22. The method of Claim 19, wherein the ligating step takes place in the presence of *Sca* I endonuclease.

23. The method of Claim 19, wherein the eluting step comprises:

a. washing the magnetic beads with a wash buffer at about 50°C; and,

b. incubating the magnetic beads in water at about 65°C.

24. The method of Claim 19, comprising the additional steps of:

a. amplifying the isolated nucleic acid fragment; and,

b. sequencing the amplified nucleic acid fragment.

25. The method of Claim 24, wherein the amplification step comprises the polymerase chain reaction.

26. The method of Claim24, wherein the amplification step comprises:

a. ligating the isolated nucleic acid fragment into a vector;

b. transforming the ligated vector into a microorganism;

c. amplifying the vector by maintaining the microorganism under conditions favoring growth of the microorganism; and,

d. recovering the amplified vector from the microorganism.